






## USEFULNESS OF INFORMATION AND COMMUNICATION TECHNOLOGIES: PORTUGUESE NURSES' LOOK

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### ABSTRACT

**Objective:** to identify nurses' perception on the usefulness of information and communication technologies in their professional practice, as well as in communication among the multidisciplinary team.

**Method:** this is a quantitative, descriptive study, of exploratory character, carried through with 3.451 nurses from 36 hospital institutions of Portugal. A questionnaire was used as a data collection instrument. In data analysis, using SPSS<sup>®</sup> resorted to descriptive statistics.

**Results:** of the nine technologies under study, we found that regarding their usefulness in professional practice, nurses qualified as useful or very useful: Intranet (84.3%), email (79.5%), SClínico<sup>®</sup> (74.8%), Nursing Practice Support System (70.9%), Physician Support System (63.2%), newsletter (62.9), ALERT<sup>®</sup> (59.4%), Health Data Platform (42.8%) and SONHO<sup>®</sup> (31.8). Regarding its usefulness in communication among the multidisciplinary team, nurses qualified as useful or very useful: email (75.2%), Intranet (74.2%), SClínico (72.5%), Nursing Practice Support System (67.1%), Physician Support System (63.6%), ALERT<sup>®</sup> (58.9%), newsletter (57.2), Health Data Platform (40.1%) and SONHO<sup>®</sup> (29.4%).

**Conclusion:** despite the usefulness of technologies presenting relevant percentages, it is pertinent to analyze why nurses' perceived usefulness is superior to Intranet and email when compared with specific technologies of care data used in the hospital context.

**DESCRIPTORS:** Nursing. Hospital. health Technologies. Information technology. Professional practice.

**HOW CITED:** Ribeiro OM, Martins MM, Vandresen L, Silva JM, Cardoso MF. Usefulness of information and communication technologies: portuguese nurses' look. Texto Contexto Enferm [Internet]. 2021 [cited YEAR MONTH DAY]; 30: e20190139. Available from: <https://doi.org/10.1590/1980-265X-TCE-2019-0139>

# UTILIDADE DAS TECNOLOGIAS DE INFORMAÇÃO E COMUNICAÇÃO: OLHAR DOS ENFERMEIROS PORTUGUESES

## RESUMO

**Objetivo:** identificar a percepção dos enfermeiros sobre a utilidade das tecnologias de informação e comunicação na sua prática profissional, bem como na comunicação entre a equipe multidisciplinar.

**Método:** estudo quantitativo, descritivo, de caráter exploratório, realizado com 3.451 enfermeiros, de 36 instituições hospitalares de Portugal Continental. Como instrumento de coleta de dados foi utilizado um questionário. Na análise dos dados, utilizando o SPSS®, recorreu-se à estatística descritiva.

**Resultados:** das nove tecnologias em estudo constata-se que relativamente à sua utilidade na prática profissional, os enfermeiros qualificaram como útil ou muito útil a Intranet (84,3%), o Correio Eletrónico (79,5%), o SClínico® (74,8%), o Sistema de Apoio à Prática de Enfermagem (70,9%), o Sistema de Apoio ao Médico (63,2%), o Boletim informativo (62,9%), o ALERT® (59,4%), a Plataforma de Dados da Saúde (42,8%) e o SONHO® (31,8%). No que se refere à sua utilidade no âmbito da comunicação entre a equipe multidisciplinar, os enfermeiros qualificaram como útil ou muito útil o Correio Eletrónico (75,2%), a Intranet (74,2%), o SClínico® (72,5%), o Sistema de Apoio à Prática de Enfermagem (67,1%), o Sistema de Apoio ao Médico (63,6%), o ALERT® (58,9%), o Boletim informativo (57,2%), a Plataforma de Dados da Saúde (40,1%) e o SONHO® (29,4%).

**Conclusão:** apesar da utilidade das tecnologias apresentar percentuais relevantes, torna-se pertinente analisar o motivo pelo qual a percepção de utilidade dos enfermeiros é superior para a Intranet e para o Correio Eletrónico quando comparados com as tecnologias específicas de dados assistenciais utilizadas no contexto hospitalar.

**DESCRITORES:** Enfermagem. Hospitais. Tecnologias em saúde. Tecnologia da informação. Prática profissional.

# UTILIDAD DE LAS TECNOLOGÍAS DE LA INFORMACIÓN Y LA COMUNICACIÓN: LA VISIÓN DE LAS ENFERMERAS PORTUGUESAS

## RESUMEN

**Objetivo:** identificar la percepción de los enfermeros sobre la utilidad de las tecnologías de la información y la comunicación en su práctica profesional, así como en la comunicación entre el equipo multidisciplinario.

**Método:** estudio cuantitativo, descriptivo, exploratorio, realizado con 3.451 enfermeros, de 36 instituciones hospitalarias de Portugal. Como instrumento de recolección de datos se utilizó un cuestionario. En el análisis de datos, usando el SPSS®, fue utilizado estadística descriptiva.

**Resultados:** de las nueve tecnologías estudiadas, encontramos que en relación a su utilidad en la práctica profesional, los enfermeros describieron la Intranet (84,3%), el correo electrónico (79,5%), el SClínico® (74,8%), el Sistema de Apoyo a la Práctica de Enfermería (70,9%), el Sistema de Apoyo al Médico (63,2%), el boletín informativo (62,9%), el ALERT® (59,4%), el Plataforma de Datos de Salud (42,8%) y el SONHO® (31,8%). En cuanto a su utilidad en el contexto de comunicación entre el equipo multidisciplinario, los enfermeros calificaron el correo electrónico (75,2%), la Intranet (74,2%), el SClínico® (72,5%), el Sistema de Apoyo a la Práctica de Enfermería (67,1%), el Sistema de Apoyo al Médico (63,6%), el ALERT® (58,9%), el boletín informativo (57,2%), la Plataforma de Datos de Salud (40,1%) y el SONHO® (29,4%).

**Conclusión:** a pesar de la utilidad de las tecnologías para presentar porcentajes relevantes, es pertinente analizar la razón por la cual la percepción de utilidad de las enfermeras es superior para la Intranet y para el Correo Electrónico cuando se compara con las tecnologías específicas de datos asistenciales utilizadas en el contexto hospitalario.

**DESCRIPTORES:** Enfermería. Hospitales. Tecnologías sanitarias. Tecnología de la información. Práctica profesional.

## INTRODUCTION

The insertion of technologies and technological innovations in the health sector grows exponentially. The discussion on the use of Information and Communication Technologies (ICTs) in health are part of Health at a Glance: Europe 2018 as an emerging theme and priority of government organizations.<sup>1</sup>

In Portugal, technologies have been increasingly integrated into health services. The global recognition that eHealth acquired throughout Europe stands out, being a global encouragement from governments for the implementation of ICTs with consequent improvement of quality, production and resource management. In this sense, Portugal has encouraged health institutions through the development of information systems aimed at facilitating registrations and streamlining processes, fostering transparency, preventing waste and encouraging the fight against fraud.<sup>2</sup>

Currently, it is known that technologies pervade health professionals' world of work. Among them, nurses account for a large part of the workforce in the health sector, with similar work processes among peers in different countries.<sup>3</sup> From authors' perspective, nursing is at an intersection of opportunities to challenge global health issues, such as the scarcity of professionals and the insertion of ICTs, and nurses can encourage leaders to create spaces for the implementation and effective use of ICT.<sup>4</sup>

When playing a major role in health institutions, nurses are generally responsible for organizing, maintaining and coordinating operations in various places where people's health needs are met. In many environments, nurses are the ones who articulate the multidisciplinary team's work and who have significant responsibilities in management.<sup>5</sup>

It is in these contexts that the pertinence of incorporating ICTs in practice environments emerges, constituting a movement that signals the permanence of technologies in care production spaces, composing part of the work in health and, more specifically, in nursing.

ICTs are instruments that can generate impacts on health professionals' work. A study related using ICTs with organization and improvement in the multidisciplinary team's work.<sup>6</sup> Thus, it is noteworthy that, technologies, when well used, can positively influence the environments of practice, contributing to achieve the objectives related to safety and quality in nursing professionals' work.<sup>7</sup>

To achieve these objectives, among other aspects, there is a need for information systems and information technologies that integrate the collaboration of different health professionals in favor of high levels of quality in the care process of sick people.<sup>8</sup>

In Portugal, although there are very diverse ICTs, at the time of data collection, there were nine ICTs in public hospitals: Nursing Practice Support System (SAPE - *Sistema de Apoio à Prática de Enfermagem*); SClínico®; Physician Support System (SAM - *Sistema de Apoio ao Médico*); ALERT®; Integrated Hospital Information System called SONHO®; Health Data Platform (PDS - *Plataforma de Dados da Saúde*); Intranet; newsletter; email.

SAPE, currently updated in SClínico, is a resource that allows the computerization of the different phases of Nursing Process; SAM is a computer-oriented application for physicians' practices; ALERT® is a clinical software that in most of the hospitals under study is implemented in Emergency Services; SONHO, acronym of Integrated Hospital Information System, has as main features patient registration, information about the procedure performed in patients in International Classification of Diseases (ICD) codes and the registration of patients leaving with transformation into Homogeneous Diagnostic Groups (HDG) for financial accounting related to the passage of patients in the hospital. Finally, PDS is also a web platform that allows access to information for citizens who have a user number in the Portuguese National Health System (SNS - *Sistema Nacional de Saúde*), without the need for commuting and/or sending documents between institutions.

Although ICTs are diverse and with immense potential, the problem is that, in practice, some gaps are notorious, such as difficulty in use, challenges in the implementation and support of computer professionals, aspects that have been compromising the effective use of ICT.

Considering the above, with this study we sought to identify nurses' perception about the usefulness of ICTs in their professional practice, as well as in communication among the multidisciplinary team.

## METHOD

This is a quantitative, descriptive, exploratory research,<sup>9</sup> conducted in 36 hospital institutions of Portugal in March 2016. Non-probabilistic sampling for convenience was used. Nurses in professional practice and exercising their professional activity in the hospital institution within a period of time equal to or greater than six months, in the departments of medicine and medical specialties, surgery and surgical specialties or intensive care medicine and emergency were included.

Thus, after approval of the respective ethics committees of the institutions involved, data collection was performed. Taking into account the services of each hospital institution in which the study was authorized, the accessible population corresponded to 10,013 nurses. In accordance with the defined criteria, all nurses who belonged to the nursing teams of services where the study was authorized, who had been working for more than six months and who agreed to participate were included in the sample, which consisted of 3,451 nurses. After clarifying the objectives and procedures inherent to the investigation, through written information made available at the service, or by the physical presence of the researcher, to the nurses who agreed to participate in the study, they were asked to sign an Informed Consent Form, with confidentiality and anonymity in information use and disclosure obtained being guaranteed.

The instrument used in data collection was a structured self-administered questionnaire, consisting of two parts. Part I - Respondent characterization; Part II - Nurses' perception of the usefulness of information and communication technologies in professional nursing practice and communication among the multidisciplinary team.

Although in Portugal there are still no studies to prove, the use of the various ICTs by nurses seems to be, in some cases, related to the usefulness that is attributed to each technology. For this reason, it was considered relevant to assess nurses' perception about the usefulness of ICTs in their professional practice, as well as in communication among the multidisciplinary team. Based on this assumption, it was decided by the authors that in the instrument elaborated, in the ordinal variables<sup>9</sup> usefulness of ICTs nurses' professional practice and usefulness of ICTs in communication among the multidisciplinary team, the scale of responses of type Likert can vary between 1 and 5; and 1 corresponds to useless; 2 corresponds to not very useful; 3 corresponds to I have no opinion or do not know; 4 corresponds to useful; 5 corresponds to very useful.

For data processing and analysis, we used the statistical program Statistical Package for the Social Sciences (SPSS), version 22.0. According to variables' nature and the objectives of the study, we used descriptive statistics.<sup>9</sup>

It should be noted that this research is part of a broader investigation, carried out in the national context, on the contexts of hospital practice and nurses' conceptions, initially approved by the Health Ethics Committee of *Centro Hospitalar de São João*, under Opinion 98-15.

## RESULTS

The results of this study show that of the 3,451 nurses, most are female (77.1%). The mean age is 36.4 years, with a standard deviation of 8.3. Most are married/in a common-law marriage (61.1%), followed by single (33.8%), divorced (4.7%) and widower (0.3%). With regard to academic degree, teaching license prevails (88.0%), followed by master's degree (10.7%), bachelor's degree (1.1%), and PhD degree (0.2%).

Regarding the regional distribution of nurses, according to the Regional Health Administration regions to which hospital institutions belong, the North prevailed (43.2%), followed by Lisbon and the Tagus Valley (24.0%), the Center (22.3%), the Alentejo (6.2%) and the Algarve (4.2%). In the distribution of nurses through services where they perform functions, medical services and medical specialties (44.2%), surgery and surgical specialties (33.7%), and intensive care medicine and emergency (22.1%) predominated.

Concerning profession, most are nurses (76.3%), followed by specialist nurses (19.9%) and nurse managers (3.8%). As for time distribution of professional practice, for nurses, the mean time is 12.2 years, with a standard deviation of 7.7; for specialist nurses, the mean time is 15.7 years, with a standard deviation of 7.2; for nurse managers, the mean time is 27.2 years, with a standard deviation of 6.2.

Regarding the specialty of specialist nurses, rehabilitation nursing (44.6%) figures prominently, followed by medical-surgical nursing (37.8%). In relation to nurse managers, medical-surgical nursing (40.3%) and rehabilitation nursing (32.8%) predominated.

In addition to sociodemographic and professional data, in compliance with the objectives of the research, with the application of the questionnaire it was possible to identify nurses' perception about the usefulness of ICTs in professional practice, as well as about their usefulness in communication among the multidisciplinary team.

### Usefulness of information and communication technologies in nurses' professional practice

Regarding nurses' perception about the usefulness of ICTs in professional practice, the results are presented in Table 1.

With regard to SAPE, useful is the most frequent response (48.6%), followed by I have no opinion or do not know (22.6%). The results presented in Table 1 show that the usefulness of this technology is high, and it should be noted that useful and very useful together account for 70.9% of nurses.

In SCLínico®, useful is the most frequent response (44.4%), followed by very useful (30.4%). Therefore, the usefulness of this technology is high, and it should be noted that useful and very useful together account for 74.7% of nurses.

In SAM, useful is the most frequent response (49.1%), followed by I have no opinion or do not know (31.9%). The usefulness of this technology is moderate, and it should be noted that useful and very useful together account for 63.2% of nurses.

In ALERT®, useful is the most frequent response (42.9%), followed by I have no opinion or do not know (34.9%). The results show that the usefulness of this technology is moderate, and it should be noted that useful and very useful together account for 59.4% of nurses.

**Table 1** – Numerical and percentage distribution on the usefulness of information and communication technologies in nurses' professional practice. Porto, Portugal, 2016. (n=3451)

| Technology | Frequency |     |                 |      |            |      |        |      |             |      |       |       |
|------------|-----------|-----|-----------------|------|------------|------|--------|------|-------------|------|-------|-------|
|            | Useless   |     | Not very useful |      | No opinion |      | Useful |      | Very useful |      | Total |       |
|            | n         | %   | n               | %    | n          | %    | n      | %    | n           | %    | n     | %     |
| SAPE       | 63        | 1.8 | 162             | 4.7  | 780        | 22.6 | 1677   | 48.6 | 769         | 22.3 | 3451  | 100.0 |
| SClínico   | 39        | 1.1 | 122             | 3.5  | 711        | 20.6 | 1531   | 44.4 | 1048        | 30.4 | 3451  | 100.0 |
| SAM        | 56        | 1.6 | 112             | 3.2  | 1102       | 31.9 | 1694   | 49.1 | 487         | 14.1 | 3451  | 100.0 |
| ALERT      | 83        | 2.4 | 116             | 3.4  | 1203       | 34.9 | 1479   | 42.9 | 570         | 16.5 | 3451  | 100.0 |
| SONHO      | 103       | 3.0 | 558             | 16.2 | 1693       | 49.1 | 819    | 23.7 | 278         | 8.1  | 3451  | 100.0 |
| PDS        | 65        | 1.9 | 408             | 11.8 | 1501       | 43.5 | 1061   | 30.7 | 416         | 12.1 | 3451  | 100.0 |
| Intranet   | 25        | 0.7 | 105             | 3.0  | 410        | 11.9 | 1989   | 57.6 | 922         | 26.7 | 3451  | 100.0 |
| Newsletter | 42        | 1.2 | 407             | 11.8 | 832        | 24.1 | 1663   | 48.2 | 507         | 14.7 | 3451  | 100.0 |
| Email      | 55        | 1.6 | 239             | 6.9  | 414        | 12.0 | 1993   | 57.8 | 750         | 21.7 | 3451  | 100.0 |

In the Integrated Hospital Information System, known as SONHO®, I have no opinion or do not know is the most frequent answer (49.1%), followed by useful (23.7%). The results indicate that the usefulness of this technology is very low, and it should be noted that useful and very useful together account for only 31.8% of nurses.

In PDS, I have no opinion or do not know is the most frequent response (43.5%), followed by useful (30.7%). From the results, we found that the usefulness of this technology is low, and it should be noted that useful and very useful together account for only 42.8% of nurses.

With regard to Intranet, useful is the prevailing response (57.6%), followed by very useful (26.7%). Therefore, the usefulness of this technology is very high, and it should be noted that useful and very useful together account for 84.4% of nurses.

In the newsletter, useful is the most frequent answer (48.2%), followed by I have no opinion or do not know (24.1%). The usefulness of this technology is moderate, and it should be noted that useful and very useful together account for 62.9% of nurses.

With regard to email, useful is the prevailing response (57.8%), followed by very useful (21.7%). Therefore, the usefulness of this technology is high, and it should be noted that useful and very useful together account for 79.5% of nurses.

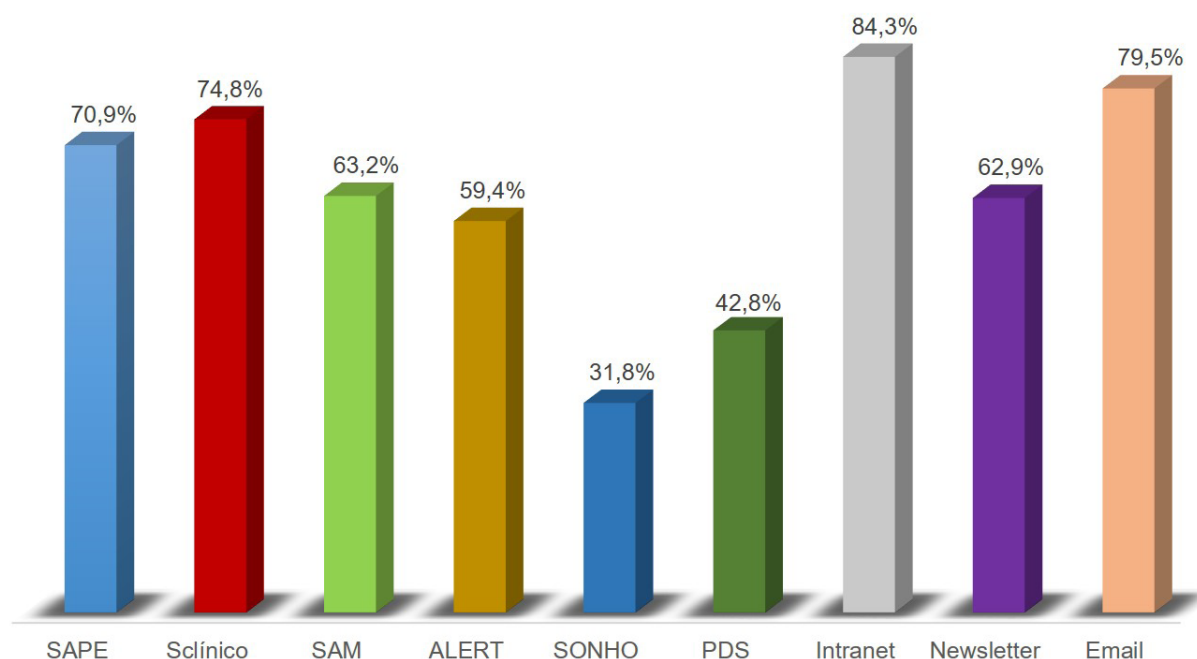
Figure 1 signals the percentage of usefulness (useful and very useful) of the ICTs mentioned.

The results described show that the ICTs that nurses consider to be more useful for professional practice are Intranet, email, SClínico®, SAPE, SAM, newsletter, ALERT®, PDS, and SONHO®.

## Usefulness of ICTs in communication among the multidisciplinary team

Regarding nurses' perception about the usefulness of ICTs in communication among the multidisciplinary team, the results are presented in Table 2.





**Figure 1** – Percentage of usefulness of information and communication technologies in nurses' professional practice. Porto, Portugal, 2016.

**Table 2** – Numerical and percentage distribution on the usefulness of information and communication technologies in communication among the multidisciplinary team. Porto, Portugal, 2016. (n=3451)

| Technology | Frequency |     |                 |      |            |      |        |      |             |      |       |       |
|------------|-----------|-----|-----------------|------|------------|------|--------|------|-------------|------|-------|-------|
|            | Useless   |     | Not very useful |      | No opinion |      | Useful |      | Very useful |      | Total |       |
|            | n         | %   | n               | %    | n          | %    | n      | %    | n           | %    | n     | %     |
| SAPE       | 86        | 2.5 | 215             | 6.2  | 833        | 24.1 | 1539   | 44.6 | 778         | 22.5 | 3451  | 100.0 |
| SClinico   | 65        | 1.9 | 156             | 4.5  | 729        | 21.1 | 1459   | 42.3 | 1042        | 30.2 | 3451  | 100.0 |
| SAM        | 63        | 1.8 | 153             | 4.4  | 1039       | 30.1 | 1658   | 48.0 | 538         | 15.6 | 3451  | 100.0 |
| ALERT      | 88        | 2.5 | 134             | 3.9  | 1196       | 34.7 | 1484   | 43.0 | 549         | 15.9 | 3451  | 100.0 |
| SONHO      | 141       | 4.1 | 552             | 16.0 | 1744       | 50.5 | 746    | 21.6 | 268         | 7.8  | 3451  | 100.0 |
| PDS        | 74        | 2.1 | 442             | 12.8 | 1549       | 44.9 | 998    | 28.9 | 388         | 11.2 | 3451  | 100.0 |
| Intranet   | 58        | 1.7 | 216             | 6.3  | 616        | 17.8 | 1922   | 55.7 | 639         | 18.5 | 3451  | 100.0 |
| Newsletter | 82        | 2.4 | 279             | 8.1  | 1115       | 32.3 | 1526   | 44.2 | 449         | 13.0 | 3451  | 100.0 |
| Email      | 88        | 2.5 | 273             | 7.9  | 498        | 14.4 | 1931   | 56.0 | 661         | 19.2 | 3451  | 100.0 |

For SAPE, useful is the most frequent response (44.6%), followed by I have no opinion or do not know (24.1%). The results presented in Table 2 indicate that the usefulness of this technology is moderate, and it should be noted that useful and very useful together account for 67.1% of nurses.

In SClinico®, useful is the most frequent response (42.3%), followed by very useful (30.2%). Therefore, the usefulness of this technology is high, and it should be noted that useful and very useful together account for 72.5% of nurses.

Regarding SAM, useful is the most frequent response (48.0%), followed by I have no opinion or do not know (30.1%). Therefore, the usefulness of this technology is high, and it should be noted that useful and very useful together account for 63.6% of nurses.

Regarding ALERT®, useful is the most frequent response (43.0%), followed by I have no opinion or do not know (34.7%). From the results, we found that the usefulness of this technology is moderate, and it should be noted that useful and very useful together account for 58.9% of nurses.

In SONHO®, I have no opinion or do not know is the prevailing answer (50.5%), followed by useful (21.6%). Therefore, the usefulness of this technology is high, and it should be noted that useful and very useful together account for 29.4% of nurses.

In PDS, I have no opinion or do not know is the most frequent answer (44.9%), followed by useful (28.9%). Therefore, the usefulness of this technology is low, and it should be noted that useful and very useful together account for only 40.2% of nurses.

Regarding Intranet, useful is the prevailing response (55.7%), followed by very useful (18.5%). Therefore, the usefulness of this technology is high, and it should be noted that useful and very useful together account for 74.2% of nurses.

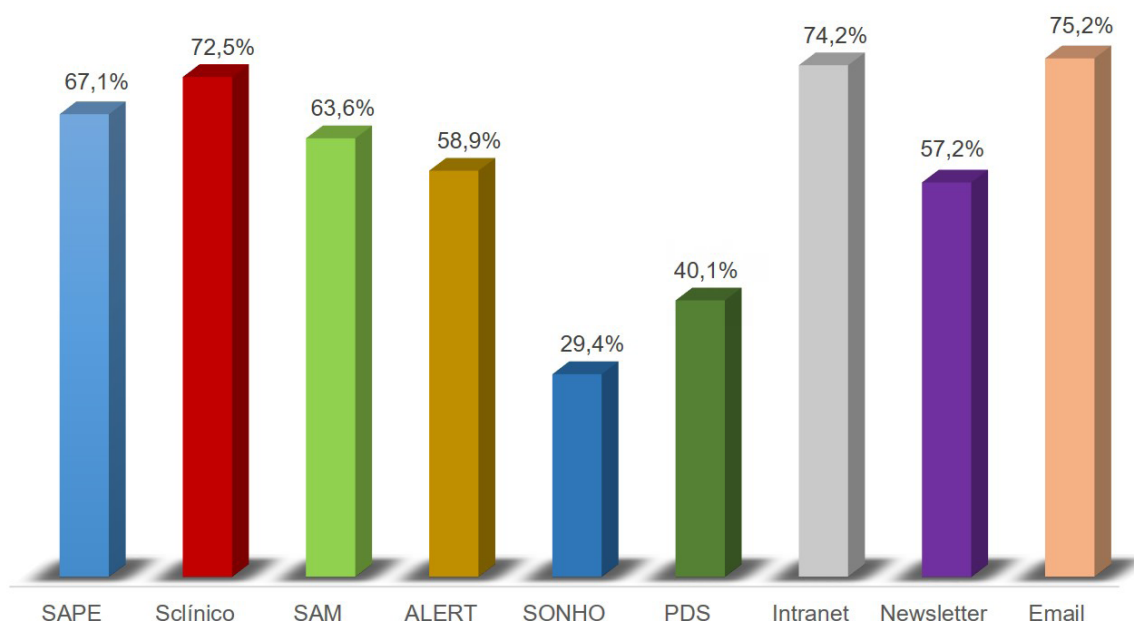
In the newsletter, useful is the most frequent answer (44.2%), followed by I have no opinion or do not know (32.3%). The results show that the usefulness of this technology is moderate, and it should be noted that useful and very useful together account for 57.2% of nurses.

Finally, in email, useful is the prevailing response (56.0%), followed by very useful (19.2%). Therefore, the usefulness of this technology is high, and account for it should be noted that useful and very useful together represent 75.1% of nurses.

Figure 2 illustrates the percentage of usefulness (useful and very useful) of the ICTs mentioned in relation to communication among the multidisciplinary team.

The results described demonstrate that the ICTs that nurses consider to be more useful for communication among the multidisciplinary team are email, Intranet, SClínico®, SAPE, SAM, ALERT®, newsletter, PDS, and SONHO®.

After the presentation of the results, it is observed that the distribution of responses to each technology as to its usefulness in communication among the multidisciplinary team is very close to that recorded in relation to the usefulness of technologies for nurses' professional practice.



**Figure 2** – Percentage of the usefulness of information and communication technologies in communication among the multidisciplinary team. Porto, Portugal, 2016.



## DISCUSSION

ICTs increasingly occupy a prominent place in organizations, a reality to which health services are not oblivious.<sup>10</sup> In the case of hospital institutions, it is indisputable that ICTs permeate health professionals' work, and several applications of ICTs are found, which in addition to being important working instruments, can, when well used, be promoters of the improvement of practice environments.<sup>7</sup>

The fact that in hospital contexts is found different software computerization signals the need for strategic focus of organizations for the choice of ICTs that may be more appropriate and generate more benefits for organizations.<sup>11</sup>

With regard to the usefulness of technologies in nurses' professional practice and in communication among the multidisciplinary team, despite the coherence between the results of this study, it is pertinent to analyze the reason why the perception of usefulness is superior for the Intranet and email, when compared with the specific technologies of the nursing profession and course, such as SAPE, currently updated in SCclínico® in all public hospitals.<sup>12</sup>

In recent years, hospital institutions have undergone significant changes with dependence on the increase in ICTs. With regard to the technologies included in the research, SAPE and its updating, in SCclínico®, whose conceptual matrices explicitly incorporate items that translate nursing thinking process are not as expected the technologies qualified by nurses as most useful, what imposes our reflection. In a study published in 2018, factors were identified that condition the valorization of these technologies, of which we highlight: the frequent updates of the technology; the lack of software integration and interoperability; the complexity of the technology; the inadequacy of technology to the contexts of practice; the lack of knowledge about the technology; the time spent making records.<sup>13</sup>

Since hospital computerization software is an emerging resource to be used in all healthcare organizations, it is a challenge to use it systematically and effectively. The problem is that, in practice, the lack of knowledge about the potential of technologies conditions their use by nurses.<sup>7</sup>

In relation to PDS and the Integrated Hospital Information System, which allow sharing biometric and clinical information, the finding of high percentages in the option I don't have an opinion or I don't know it is specifically related to the lack of knowledge regarding the potential of these technological resources.

SAM, being the physician support system, and ALERT, constituting the existing clinical system in emergency services, convey information relevant to the implementation of interdependent interventions, which is why a significant percentage of nurses find them useful.

Finally, ease of accessibility of information justifies the high usefulness percentorsised by nurses regarding Intranet and email, especially in order to have access to relevant information related to clinical practice, which, in turn, from the perspective of other authors, improves quality of care and communication among professionals.<sup>14</sup> In this context, given the results of the study, the idea is that nurses' clinical judgment can be based on the general knowledge made available on the Intranet and/or by e-mail, often as a result of sharing between colleagues at the expense of relevant and specific data for each patient, available in SAPE, SCclínico®, SAM, and PDS technologies.

Like another study conducted, ICTs are still little explored by professionals, and there is still to discover a world of opportunities that these instruments can provide to improve personal, professional and organizational development.<sup>6</sup> It is evident, therefore, the need for health professionals to enter the technological environment that, in addition to allowing the dissemination of knowledge, can support clinical decision-making.<sup>15-16</sup> Given that the time spent and the difficulties of access to use ICTs have been identified as the main barriers, investment in mobile devices that facilitate access, appears as an interesting possibility.<sup>8,16</sup>

In fact, in increasingly complex contexts, one wonders whether the usefulness of ICTs can be enhanced by real-time access via mobile devices, rather than only via Web.<sup>8</sup> Although this may be a possibility, it is still important to make nursing professionals aware that any technology added to care increases, in an initial phase, the complexity of the work; however, in the long run, it can increase the workload reduction, as well as improve quality of care.<sup>8</sup>

In this regard, it should be added that although some ICTs have been used to support the development of the Computerized Nursing Process,<sup>17</sup> which also happened in Portugal with SAPE and SClinico®, the need to adopt resources is urgently needed to use ICTs as a structured knowledge base, which is effectively not always possible with the Intranet and email.

In the results of this study, the percentage of usefulness of ICTs in nurses' professional practice and the percentage of usefulness of ICTs in communication among the multidisciplinary team present some specificities. The perception of usefulness of ICTs is higher in nurses' professional practice, with the exception of SAM technology. The higher percentage regarding the usefulness of SAM in communication among the multidisciplinary team occurs because nurses have to access SAM to seek medical developments and monitor information related to patients, which has effectively been confirmed in other studies.<sup>13</sup> Thus, this result reinforces what occurs in the daily practice of nurses' work regarding access to information in the systems available in the institutions.

The findings of this research also support those of other studies when they mention that organizations that use information technology technologies in nursing for a long period of time reported improvements in clinical processes, in communication among the team and in the general quality of patient care.<sup>18-19</sup>

Following the aforementioned, this study indicates the need for new research involving the understanding of usability expectations and practical application of technological resources in the care context and in communication among the multidisciplinary team.

## CONCLUSION

ICTs contribute to developing nurses' work, thus constituting a challenge to their daily and systematic use.

In the research carried out, nurses' perception of the usefulness of the Intranet and email reached percentage values higher than the usefulness of the technologies developed specifically for the purpose of user assistance registration interface and communication among the multidisciplinary team. This, in addition to translating the relevance attributed by nurses to technologies not specific to their professional practice, makes urgent the need to consolidate the use of specific communication and information technologies. One of the ways to achieve this consolidation is to carry out teaching actions, both in undergraduate courses and in continuing education, to identify opportunities for improvement and support for ICT users.

The fact that the usefulness of ICTs has been assessed only in relation to two components, professional practice and communication among the multidisciplinary team, constitutes a limitation of this study.

## REFERENCES

1. Organisation for Economic Cooperation and Development/Europe. Health at a Glance: Europe 2018: State of Health in the EU Cycle. Paris (FR): OECD Publishing; 2018 [cited 2019 Apr 02]. Available from: [https://doi.org/10.1787/health\\_glance\\_eur-2018-en](https://doi.org/10.1787/health_glance_eur-2018-en)
2. Matos AA, Nunes AM. Information and Communications Technologies (ITC) in Portuguese health system. J. Health Inform [Internet]. 2018 [cited 2019 Apr 02];10(1):30-4. Available from: <http://www.jhi-sbis.saude.ws/ojs-jhi/index.php/jhi-sbis/article/view/571/328>
3. Leal JAL, Melo CMM. The nurses' work process in different countries: an integrative review. Rev Bras Enferm [Internet]. 2018 [cited 2019 Mar 01];71(2):413-23. Available from: <http://doi.org/10.1590/0034-7167-2016-0468>
4. Abbott PA, Coenen A. Globalization and advances in information and communication technologies: The impact on nursing and health. Nurs Outlook [Internet]. 2008 [cited 2019 Mar 03];56(5):238-46. Available from: <https://doi.org/10.1016/j.outlook.2008.06.009>
5. Lorenzetti J, Gelbcke FL, Vandresen L. Management technology for hospital inpatient care units. Texto Contexto Enferm [Internet]. 2016 [cited 2019 Apr 13];25(2):e170015. Available from: <https://doi.org/10.1590/0104-07072016001770015>
6. Mota DN, Torres RA, Guimarães JM, Marinho MN, Araújo AF. Information and communication technologies: influences in the work of the Family Health strategy. J Health Inform [Internet]. 2018 [cited 2019 Apr 02];10(2):45-9. Available from: <http://www.jhi-sbis.saude.ws/ojs-jhi/index.php/jhi-sbis/article/view/563/330>
7. Ferreira AM, Oliveira JL, Camillo NR, Reis GA, Évora YD, Matsuda LM. Perceptions of nursing professionals about the use of patient safety computerization. Rev Gaúcha Enferm [Internet]. 2019 [cited 2019 Mar 18];40(Spe):e20180140. Available from: <https://doi.org/10.1590/1983-1447.2019.20180140>
8. Barra DCC, Almeida SRW, Sasso GTMD, Paese F, Rios GC. Method for the modeling and structuring of computerized nursing in intensive care. Texto Contexto Enferm [Internet]. 2016 [cited 2019 Mar 16]; 25(3):e2380015. Available from: <https://doi.org/10.1590/0104-07072016002380015>
9. Coutinho CP. Metodologia de Investigação em Ciências Sociais e Humanas: Teoria e Prática. 2nd ed. Coimbra (PT): Edições ALMEDINA; 2014.
10. Mota LA, Pereira FM, Sousa PA. Nursing Information Systems: exploration of information shared with physicians. Rev Enf Ref [Internet]. 2014 [cited 2019 Mar 23];1:85-91. Available from: [http://www.scielo.mec.pt/scielo.php?pid=S0874-02832014000100010&script=sci\\_arttext&lng=pt](http://www.scielo.mec.pt/scielo.php?pid=S0874-02832014000100010&script=sci_arttext&lng=pt)
11. Pinochet LH, Lopes AS, Silva JS. Inovações e tendências aplicadas nas tecnologias de informação e comunicação na gestão da saúde. Rev Gestão Sistemas Saúde [Internet]. 2014 [cited 2019 Apr 02];3(2):11-29. Available from: <https://doi.org/10.5585/rgss.v3i2.88>
12. Serviços Partilhados do Ministério da Saúde de Portugal. Sistemas de Informação da Saúde, Os Nossos Produtos. [Web page] Lisboa (PT): SPMS; 2019 [cited 2019 Apr 01]. Available from: <https://spms.min-saude.pt/product/sclinicohospitalar/>
13. Ribeiro O. Conceções e Práticas dos Enfermeiros – Olhares sobre um percurso em hospitais portugueses. Loures (PT): Lusociência; 2018.
14. Ahmad MM, Musallam R, Allah AH. Nurses and internet health-related information: review on access and utility. Clujul Med [Internet]. 2018 [cited 2019 Mar 16];91(3):266–73. Available from: <https://doi.org/10.15386/cjmed-1024>
15. Gagnon MP, Ngangue P, Payne-Gagnon J, Desmartis M. m-Health adoption by healthcare professionals: a systematic review. J Am Med Inform Assoc [Internet]. 2016 [cited 2019 Mar 12];23(1):212-20. Available from: <https://doi.org/10.1093/jamia/ocv052>

16. Barra DCC, Paim SMS, Dal Sasso GTM, Colla GW. Methods for developing mobile apps in health: na integrative review of the literature. *Texto Contexto Enferm* [Internet]. 2017. [cited 2019 Mar 29];26(4):e2260017. Available from: <https://doi.org/10.1590/0104-07072017002260017>
17. Sousa PAF, Dal Sasso GTM, Barra DCC. Contributions of the electronic health records to the safety of intensive care unit patients: na integrative review. *Texto Contexto Enferm* [Internet]. 2012. [cited 2019 Mar 12];21(4):971-9. Available from: <http://www.scielo.br/pdf/tce/v21n4/30.pdf>
18. Kleib M, Simpson N, Rhodes B. Information and communication technology: design, delivery, and outcomes from a nursing informatics boot camp. *Online J Issues Nurs* [Internet]. 2016 [cited 2018 Mar 06];21(2):5. Available from: <http://ojin.nursingworld.org/mainmenucategories/anamarketplace/anaperiodicals/ojin/tableofcontents/vol-21-2016/no2-may-2016/information-and-communication-technology.html>
19. Lavin MA, Harper E, Barr N. Health information technology, patient safety, and professional nursing care documentation in acute care settings. *Online J Issues Nurs* [Internet]. 2015 [cited 2019 Apr 11];20(2):6. Available from: <http://ojin.nursingworld.org/mainmenucategories/anamarketplace/anaperiodicals/ojin/tableofcontents/vol-20-2015/no2-may-2015/articles-previous-topics/technology-safety-and-professional-care-documentation.html>

## NOTES

### ORIGIN OF THE ARTICLE

This original article is part of a more comprehensive investigation on “the contexts of hospital practice and nurses’ conceptions”. This investigation culminated in the thesis “*Contextos da prática hospitalar e concepções de enfermagem: olhares sobre o real da qualidade e o ideal da excelência no exercício profissional dos enfermeiros*”, presented to the Doctoral Program in Nursing Sciences at *Instituto de Ciências Biomédicas Abel Salazar of Universidade do Porto* in 2017.

### CONTRIBUTION OF AUTHORITY

Study design: Ribeiro OM, Martins MM.

Data collection: Ribeiro OM

Data analysis and interpretation: Ribeiro OM, Martins MM, Vandresen L

Discussion of results: Ribeiro OM, Martins MM, Vandresen L, Silva JM, Cardoso MF

Critical writing and/or content review: Ribeiro OM, Vandresen L

Final review and approval of the final version: Ribeiro OM, Martins MM, Vandresen L, Silva JM, Cardoso MF

### APPROVAL OF ETHICS COMMITTEE IN RESEARCH

This study was approved by the Health Ethics Committee of *Centro Hospitalar de São João*, under Opinion 98-15.

### CONFLICTS OF INTEREST

None.

### HISTORY

Received: June 05, 2019.

Approved: March 05, 2020.

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